



Cambridge O Level

CANDIDATE
NAMECENTRE
NUMBER

--	--	--	--	--

CANDIDATE
NUMBER

--	--	--	--

MATHEMATICS (SYLLABUS D)

4024/22

Paper 2 Calculator

May/June 2026

2 hours

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen. Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You should use a scientific calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π , use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages.

List of formulas

Area, A , of triangle, base b , height h .

$$A = \frac{1}{2}bh$$

Area, A , of circle of radius r .

$$A = \pi r^2$$

Circumference, C , of circle of radius r .

$$C = 2\pi r$$

Curved surface area, A , of cylinder of radius r , height h .

$$A = 2\pi rh$$

Curved surface area, A , of cone of radius r , sloping edge l .

$$A = \pi rl$$

Surface area, A , of sphere of radius r .

$$A = 4\pi r^2$$

Volume, V , of prism, cross-sectional area A , length l .

$$V = Al$$

Volume, V , of pyramid, base area A , height h .

$$V = \frac{1}{3}Ah$$

Volume, V , of cylinder of radius r , height h .

$$V = \pi r^2 h$$

Volume, V , of cone of radius r , height h .

$$V = \frac{1}{3}\pi r^2 h$$

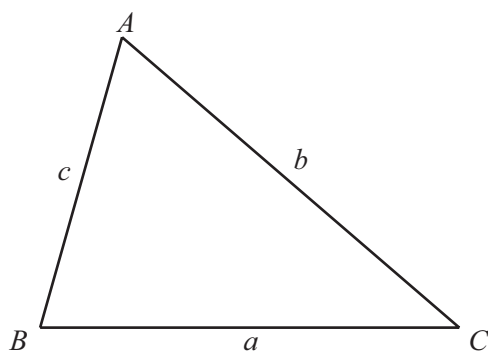
Volume, V , of sphere of radius r .

$$V = \frac{4}{3}\pi r^3$$

For the equation $ax^2 + bx + c = 0$, where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

For the triangle shown,



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\text{Area} = \frac{1}{2}ab \sin C$$

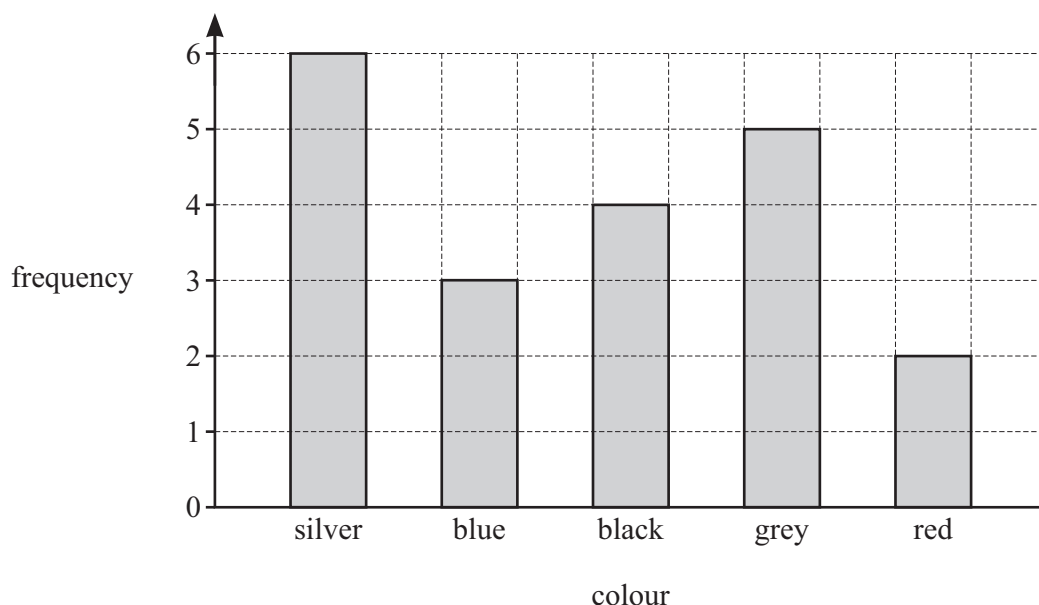


- 1 Write these numbers in order of size, starting with the smallest.

$\frac{2}{5}$ 0.42 38%

.....,, [1]
smallest

- 2 Maison records the colours of all the cars in a car park.
 The results are shown in the bar chart.



- (a) Write down the colour of car that is recorded the least number of times.

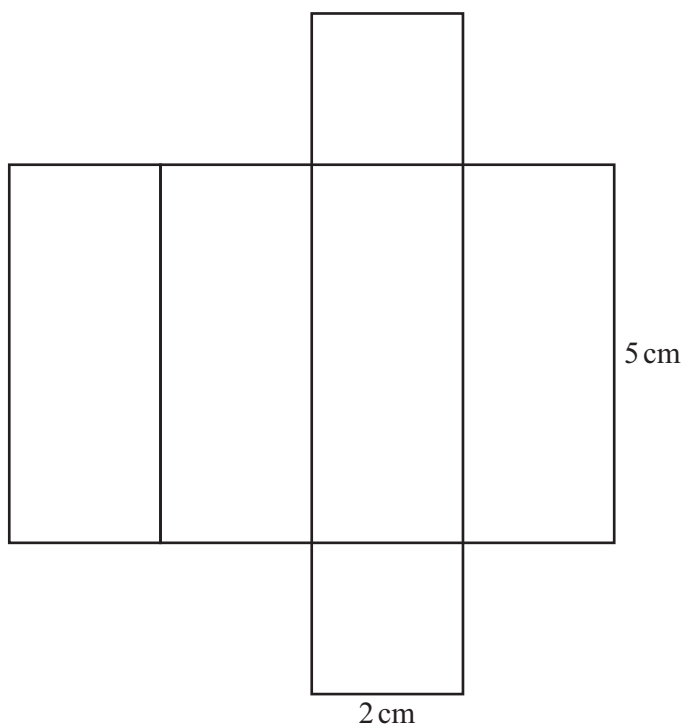
..... [1]

- (b) Find the total number of cars in the car park.

..... [1]



- 3 The diagram shows the net of a cuboid made from four congruent rectangles and two congruent squares.



Find the total length of the edges of the cuboid.

..... cm [2]

- 4 Calculate.

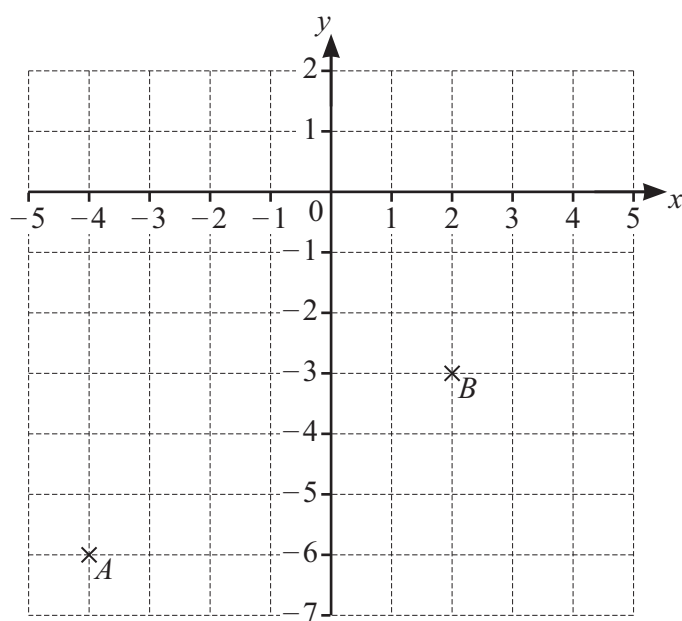
$$\frac{2.5^4}{3.09 + \sqrt{16.98}}$$

Give your answer correct to 2 decimal places.

..... [2]



5 Point A and point B are plotted on the grid.



(a) Write down the coordinates of point B .

(..... ,) [1]

(b) Work out the gradient of AB .

..... [2]

(c) Find the coordinates of the midpoint of the line AB .

(..... ,) [1]



- 6 Sara and Bill share some money in the ratio 5:6.
Sara receives \$60.

(a) Calculate the amount Bill receives.

\$..... [2]

- (b) Sara uses her \$60 to buy books.
Each book costs \$7.

Find the maximum number of books she can buy.

..... [2]

7 (a) $\mathbf{c} = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$ $\mathbf{d} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

Write $\mathbf{c} - 2\mathbf{d}$ as a column vector.

$\begin{pmatrix} \\ \end{pmatrix}$ [2]

- (b) Point P has coordinates $(1, 5)$ and $\overrightarrow{PQ} = \begin{pmatrix} -4 \\ 10 \end{pmatrix}$.

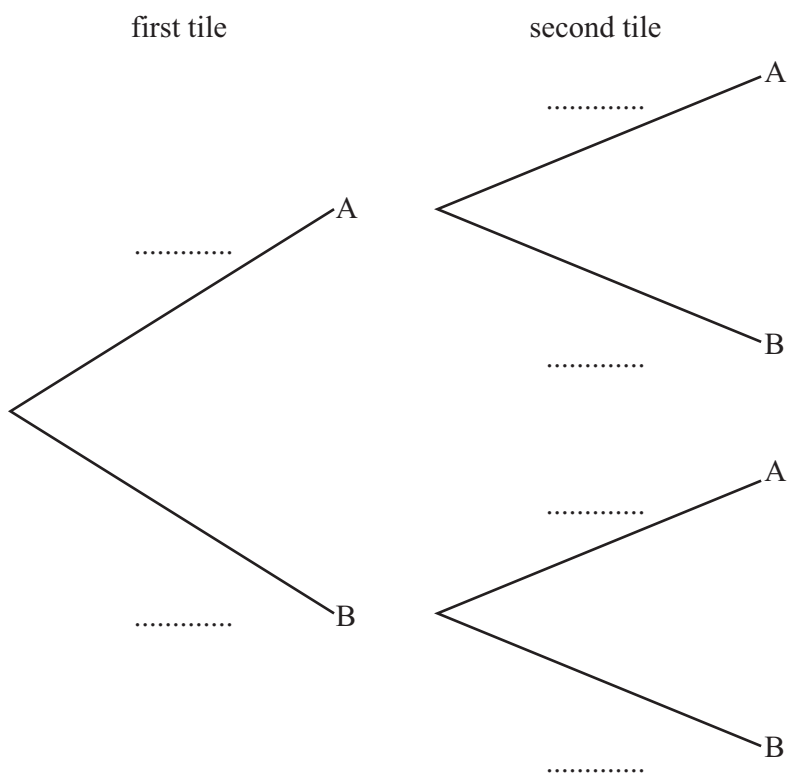
Find the coordinates of point Q .

(.....,) [2]



- 8 A bag contains 7 tiles labelled A and 5 tiles labelled B.
A tile is chosen at random from the bag and is then replaced.
A second tile is then chosen at random from the bag.

(a) Complete the tree diagram.



[2]

(b) Work out the probability that both tiles are labelled A.

..... [1]



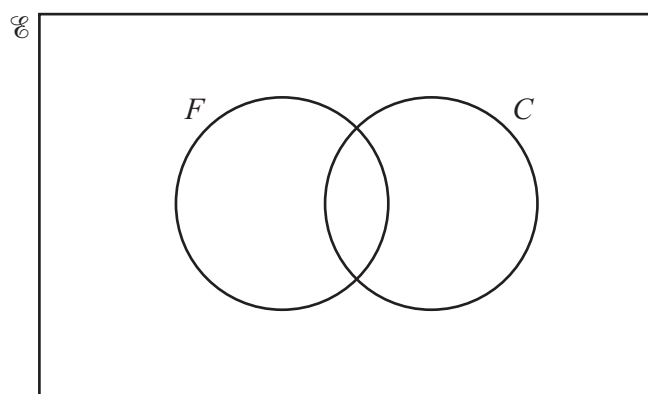
- 9 Amira walks from her home to her friend's house.
She leaves home at 09 35.
She walks a total of 8 km at an average speed of 5 km/h.

Work out the time she arrives at her friend's house.

..... [3]

- 10 $\mathcal{E} = \{x : x \text{ is an integer and } 1 \leq x \leq 9\}$
 $F = \{x : x \text{ is a factor of } 6\}$
 $C = \{x : x \text{ is a cube number}\}$

(a) Complete the Venn diagram.



[2]

(b) Find $n(F \cup C)$.

..... [1]



- 11 In a sale, a shop reduces all prices by 32%.
Before the sale, a dress costs \$56.

Work out the sale price of the dress.

\$..... [2]

- 12 Solve.

(a) $5k - 2 = 12$

$k =$ [2]

(b) $5(2y - 1) = 4(3y + 1)$

$y =$ [3]

13 $f(x) = 2x + 3$ $g(x) = \frac{1}{x-2}, \quad x \neq 2$

- (a) Find $f(-4)$.

..... [1]

- (b) Find $gf(1)$.

..... [2]





- 14 The population of a village is 1260.
The population grows exponentially at a rate of 1.7% per year.

Calculate the increase in the population at the end of 3 years.

..... [3]

- 15 Simplify.

(a) $a^5 \times a^3$

..... [1]

(b) $b \div b^6$

..... [1]

(c) $\left(\frac{4x}{y^2}\right)^3$

..... [2]



- 16 The table gives information about the speeds of 60 cars travelling along a road.

speed (s km/h)	$20 < s \leq 24$	$24 < s \leq 40$	$40 < s \leq 58$	$58 < s \leq 70$
frequency	4	22	28	6

Calculate an estimate of the mean.

..... km/h [4]

- 17 (a) f is inversely proportional to the square of h .

When $f = -\frac{3}{4}$, $h = 2$.

Find f when $h = -5$.

$f =$ [3]

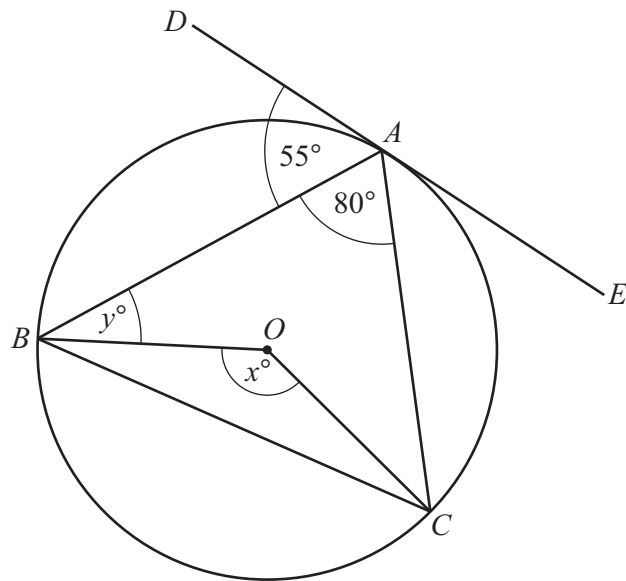
- (b) c is directly proportional to d^2 .

Complete the statement.

If d is multiplied by 4, then c is multiplied by

[1]





NOT TO SCALE

A , B and C lie on a circle, centre O .
 DE is a tangent to the circle at A .
 Angle $BAC = 80^\circ$ and angle $BAD = 55^\circ$.

(a) Find the value of x .

Give a geometrical reason for your answer.

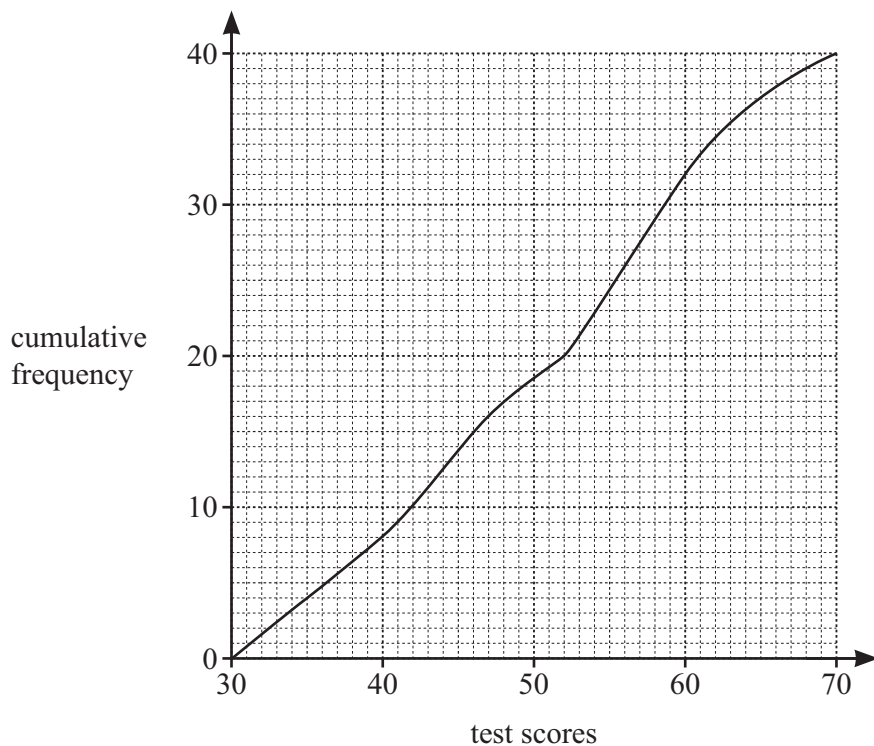
$x = \dots\dots\dots$ because $\dots\dots\dots$
 $\dots\dots\dots$ [2]

(b) Find the value of y .

$y = \dots\dots\dots$ [2]



- 19 The cumulative frequency diagram shows information about the test scores for a group of students.



- (a) Use the diagram to find an estimate for the median score.

..... [1]

- (b) In this group, 60% of the students pass the test.

Use the diagram to find the minimum score needed to pass the test.

..... [2]



- 20 The area of a rectangle is 69.5 m^2 , correct to the nearest 0.5 m^2 .
The width of the rectangle is 3.8 m , correct to the nearest 0.1 m .

Calculate the upper bound of the length of the rectangle.

..... m [3]

- 21 Simplify.

(a) $\frac{8}{32x}$

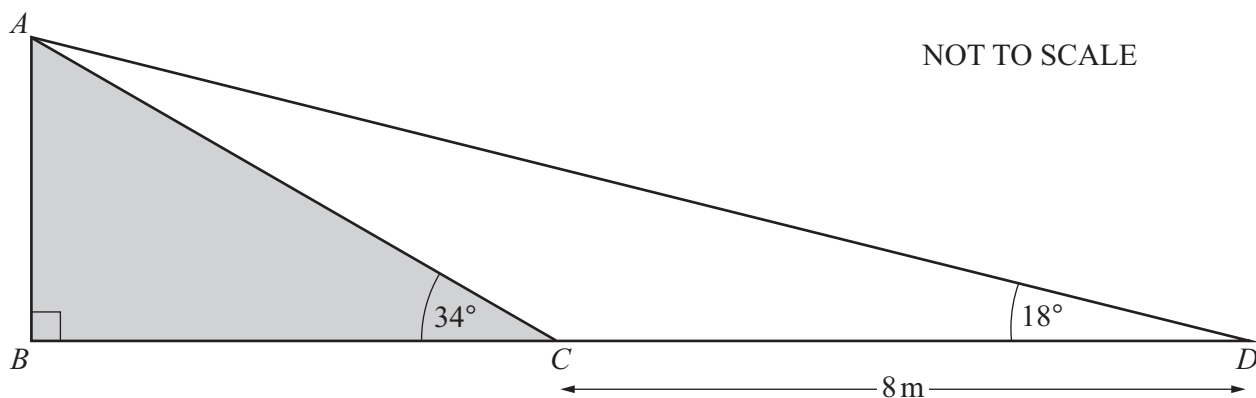
..... [1]

(b) $\frac{2f^2 - 8f}{f^2 - 16}$

..... [3]



- 22 The diagram shows a triangular garden ABD .
A path from A meets BD at point C .



$CD = 8$ m, angle $ADC = 18^\circ$, angle $ACB = 34^\circ$ and angle $ABC = 90^\circ$.

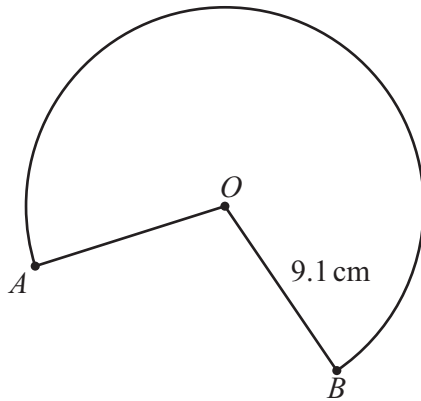
- (a) Calculate the area of triangle ABC .

..... m^2 [6]

- (b) The shaded area ABC is covered with grass seed.
A box of grass seed costs \$6.
Each box contains enough grass seed to cover an area of 5 m^2 .

Calculate the total cost of the boxes needed to cover this area with seed.

\$ [2]



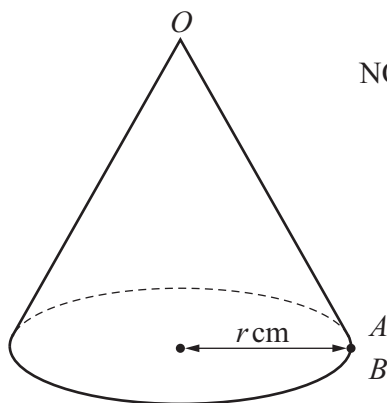
NOT TO SCALE

The diagram shows a sector of a circle with centre O and radius 9.1 cm. The length of the major arc AB is 44 cm.

- (a) Find the angle of the major sector AOB .

..... [3]

- (b) Jamila joins OA to OB to form the curved surface of a cone.



NOT TO SCALE

- (i) Show that the radius, r , of the cone is 7.0 cm, correct to 1 decimal place.





(ii) Calculate the volume of the cone.

..... cm^3 [4]

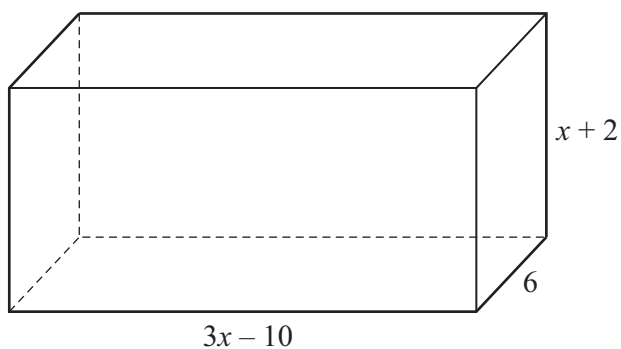
(iii) Oliver has a cone that is mathematically similar to Jamila's cone.
The volume of Oliver's cone is 2387 cm^3 .

Calculate the radius of Oliver's cone.

..... cm [3]



- 24 The diagram shows a solid cuboid.
All the lengths are in centimetres.



NOT TO SCALE

- (a) The volume of the cuboid is 720 cm^3 .

Show that $3x^2 - 4x - 140 = 0$.

[3]



- (b) Use the quadratic formula to solve $3x^2 - 4x - 140 = 0$.
Show all your working and give your answers correct to 2 decimal places.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [3]

- (c) Calculate the area of the top face of the cuboid.

$\dots\dots\dots \text{ cm}^2$ [2]

Question 25 is on the back page.





25 (a) Write $2x^2 - 8x + 7$ in the form $a(x - b)^2 + c$.

..... [3]

(b) Write down the coordinates of the turning point of the graph of $y = 2x^2 - 8x + 7$.

(..... ,) [1]

(c) The equation $2x^2 - 8x + 7 = k$ has two solutions.

Complete the inequality for k .

$k > \dots\dots\dots$ [1]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (Cambridge University Press & Assessment) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in our Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge International Education is the name of our awarding body and a part of Cambridge University Press & Assessment, which is a department of the University of Cambridge.

